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10/13/15

MEMORANDUM

TO: Mr. Addison Rice
Anderson, Mulholland and Associates

DATE: September 30, 2015

FROM: R. Infante

FILE: JC3254

RE: Data Validation
BMSMC, Former Tank Farm, PR
SM02.00.02
Accutest Job Number: JC3254

SUMMARY

Full validation was performed on the data for several groundwater samples analyzed selected volatile organic compound by method SW846-8260C, selected alcohols by method SW846-8015C (DAI) and selected semivolatiles organics (PAHs) by method 8170D (SIM) . The samples were collected at the BMSMC, Building 5 Area, Humacao, PR site on June 3-5, 2015 and submitted to Accutest Laboratories of Dayton, New Jersey that analyzed and reported the results under delivery group (SDG) JC3254.

The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "*USEPA Region 2, SOP HW-24, Validating Volatile Organic Compounds by GC/MS, SW-846 Method 8260B (August 2009-Revision 2)*, the *USEPA National Functional Guidelines for Low Concentration Organic Data Review (August 2009-Revision 2)*, the *USEPA National Functional Guidelines for Organic Data Review for Low Concentration Water (SOP HW-13, August 2009-Revision 3); Data Validation Standard Operating Procedure for Organic Analysis of Low/Medium Concentration Semivolatile Acquired using SW-846 Method 8270C* (SOW SOM01.2- SOP HW-35, August 2009 -Revision 1); Validating Semivolatile Organic Compounds by GC/MS, SW846 8270D (SOP HW-22, August, 2009 - Revision 4) (noted herein as the "primary guidance documents"). Also, QC criteria from *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update IV, December 1998),"* are utilized. The guidelines were modified to accommodate the non-CLP methodology. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

In general the data are valid as reported and may be used for decision making purposes. Results for Anthracene were qualified as estimated (J) in samples JC3254-17 and JC3254-18 due to MS/MSD recovery outside control limits; results for sample JC3254-30 qualified as estimates due to extraction of the sample one day after holding time limit.

SAMPLES

FIELD SAMPLE ID	LABORATORY ID	ANALYSIS
MW-15	JC3254-1	VOCs
MW-17	JC3254-2	VOCs
MW-5	JC3254-3	VOCs
MW-14	JC3254-4	VOCs
QC TB 030915	JC3254-5	VOCs
S-35	JC3254-6	VOCs, Alcohols
S-35D	JC3254-7	VOCs, Alcohols

FIELD SAMPLE ID	LABORATORY ID	ANALYSIS
S-36	JC3254-8	VOCs, Alcohols
S-32	JC3254-9	VOCs, Alcohols
S-33	JC3254-10	VOCs, Alcohols
MW-18	JC3254-11	VOCs
MW-3	JC3254-12	VOCs
MW-13	JC3254-13	VOCs
MW-13D	JC3254-14	VOCs
MW-7	JC3254-15	VOCs
MW-16	JC3254-16	VOCs
MW-16D	JC3254-16 MSD	VOCs
MW-16S	JC3254-16 MS	VOCs
MW-12	JC3254-17	VOCs, SVOCs
MW-12D	JC3254-18	VOCs, SVOCs
QC TB 090915	JC3254-19	VOCs
A-IR(5)	JC3254-20	VOCs, Alcohols
A-2R(2)	JC3254-21	VOCs, Alcohols
VP-1 UP-1^{N}	JC3254-22	VOCs, Alcohols
VP-2 UP-2^{N}	JC3254-23	VOCs, Alcohols
D-1R	JC3254-24	VOCs, Alcohols
S-31R(2)	JC3254-25	VOCs, Alcohols
S-31R(2)D	JC3254-25 MSD	VOCs, Alcohols
S-31R(2)S	JC3254-25 MS	VOCs, Alcohols
S-29R	JC3254-26	VOCs, Alcohols
E-1R	JC3254-27	VOCs, Alcohols
G-1R(3)	JC3254-28	VOCs, Alcohols
S-34	JC3254-29	VOCs, Alcohols
EB090915	JC3254-30	VOCs, Alcohols, SVOCs
TB090915	JC3254-31	VOCs

REVIEW ELEMENTS

Sample data were reviewed for the following parameters, where applicable to the method

- Agreement of analysis conducted with chain of custody (COC) form
- Holding time and sample preservation
- Gas chromatography/mass spectrometry (GC/MS) tunes
- Initial and continuing calibrations
- Method blanks/trip blanks/field blank

- Surrogate spike recovery
- Matrix spike/matrix spike duplicate (MS/MSD) results
- Internal standard performance
- Field duplicate results
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analysis Conducted with COC Request

Sample reports corresponded to the analytical request designated on the chain-of-custody form.

Holding Times and Sample Preservation

The cooler temperatures were within the QC acceptance criteria of 4°C ± 2°C.

Sample preservation was acceptable.

Samples analyzed within method recommended holding time except for the following:

- JC3254-30 - sample extracted one day after holding time limit. Results are qualified as estimated (J).

GC/MS Tunes

The frequency and abundance of bromofluorobenzene (BFB) tunes were within the QC acceptance criteria. All samples were analyzed within the tuning criteria associated with the method.

Initial and Continuing Calibrations

VOCs
The percent relative standard deviations (%RSDs) and response factors (RFs) of all target analytes were within the QC acceptance criteria in the initial calibration. Correlation coefficients (r^2) of target analytes were within the QC acceptance criteria. Ongoing accuracy of the instrument was determined by the analysis of a continuing calibration standard.

SVOCs
The percent relative standard deviations (%RSDs) and response factors (RFs) of all target analytes were within the QC acceptance criteria in the initial calibration. Correlation coefficients (r^2) of target analytes were within the QC acceptance criteria. Ongoing accuracy of the instrument was determined by the analysis of a continuing calibration standard.

Alcohols
The percent relative standard deviations (%RSDs) and response factors (RFs) of all target analytes were within the QC acceptance criteria in the initial calibration. Correlation coefficients (r^2) of target analytes were within the QC acceptance criteria. Ongoing accuracy of the instrument was determined by the analysis of a continuing calibration standard.

Method Blank/Trip Blank/Field Blank

Target analytes were not detected in laboratory method blanks for VOCs, SVOCs, and alcohols.

No target analyte (VOCs) detected in the trip blanks. No target analyte (VOCs, SVOCs, and Alcohols) detected in the trip blanks. No field/trip analyzed with this data package for Alcohols and VOCs.

Surrogate Spike Recovery

The surrogate recoveries were within the laboratory QC acceptance limits in all samples analyzed except for the followings:

- Nitrobezene-d5 recovery outside control limits in samples JC3254-17 and JC3254-18 due to matrix interference. Confirmed by re-extraction. No action taken.

MS/MSD

VOCs
Matrix spike was performed on samples JC3254-25MS/-25MSD; JC3254-16MS/-16MSD; JC3254-20MS/-20MSD; JC3254-6MS; and JC3137-3MS/-3MSD. Recoveries for MS/MSD and RPD were within laboratory control limits except for the following:

- Ethylbenzene MS/MSD % recoveries in sample JC3254-25MS/-25MSD outside control limits. No action taken, high level of sample relative to spike amount.

- Benzene MS/MSD % recoveries in sample JC3795-7MS/-7MSD outside control limits. No action taken, high level of sample relative to spike amount.

SVOCs
Matrix spike was performed on samples JC3769-2MS/-2MSD and JC3875-2MS/-2MSD. Recoveries for MS/MSD and RPD were within laboratory control limits except for the followings:

- Anthracene MS/MSD recoveries in sample JC3769-2 outside control limits. Results qualified as estimated (J) in affected samples.

- Chrysene MSD recovery outside control limit in sample JC3769-2. No action taken, professional judgment.

- Fluoranthene and Phenanthrene MS/MSD recoveries in sample JC3769-2 outside control limits. No action taken, no action taken due to high level of sample relative to spike amount.

Alcohols
Matrix spike was performed on samples JC3254-25MS/-25MSD. Recoveries for MS/MSD and RPD were within laboratory control limits

Internal Standard Performance

VOCs
Samples were spiked with the method specified internal standard. Internal standard performance met the QC acceptance criteria in all sample analyses.

SVOCs
Samples were spiked with the method specified internal standard. Internal standard performance met the QC acceptance criteria in all sample analyses.

Field Duplicate Results

Field duplicates were analyzed as part of this data set for VOCs, SVOCs, and Alcohols. RPD results were within laboratory/recommended control limits.

LCS/LCSD Results

VOCs
The laboratory analyzed one LCS (blank spike) associated with each matrix from this data set. The % recoveries of all spiked analytes were within the laboratory QC acceptance limits.

SVOCs
The laboratory analyzed one LCS (blank spike) associated with each matrix from this data set. The % recoveries of all spiked analytes were within the laboratory QC acceptance limits.

Alcohols
The laboratory analyzed one LCS (blank spike) associated with each matrix from this data set. The % recoveries of all spiked analytes were within the laboratory QC acceptance limits.

Quantitation Limits and Sample Results

Dilutions were required for several VOCs samples with this data set due to analyte concentration outside the calibration range.

Calculations were spot checked.

Certification

The following samples JC3254-1; JC3254-2; JC3254-3; JC3254-4; JC3254-5; JC3254-6; JC3254-7; JC3254-8; JC3254-9; JC3254-10; JC3254-11; JC3254-12; JC3254-13; JC3254-14; JC3254-15; JC3254-16; JC3254-16D; JC3254-16S; JC3254-17; JC3254-18; JC3254-19; JC3254-20; JC3254-21; JC3254-22; JC3254-23; JC3254-24; JC3254-25; JC3254-25D; JC3254-25S; JC3254-26; JC3254-27; JC3254-28; JC3254-29; and JC3254-30 were analyzed following standard procedures accepted by regulatory agencies. The quality control requirements met the methods criteria except in the occasions described in this document. The results are valid.

Rafael Infante
Chemist License 1888

Raw Data: GH101448.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	VP-1 UP-1R		
Lab Sample ID:	JC3254-22	**Date Sampled:**	09/04/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101448.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	86%		48-150%
111-27-3	Hexanol	90%		48-150%

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Rafael Infante Méndez
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ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 2B134392.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	VP-2 VP-2R		
Lab Sample ID:	JC3254-23	**Date Sampled:**	09/04/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134392.D	1	09/12/15	BK	n/a	n/a	V2B5988
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		76-120%
17060-07-0	1,2-Dichloroethane-D4	115%		73-122%
2037-26-5	Toluene-D8	106%		84-119%
460-00-4	4-Bromofluorobenzene	105%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH101449.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	VP-2 VP-2R		
Lab Sample ID:	JC3254-23	**Date Sampled:**	09/04/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101449.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	89%		48-150%
111-27-3	Hexanol	93%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 2B134393.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	D-1R		
Lab Sample ID:	JC3254-24	**Date Sampled:**	09/07/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134393.D	1	09/12/15	BK	n/a	n/a	V2B5988
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	0.30	1.0	0.27	ug/l	J
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	0.65	1.0	0.17	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		76-120%
17060-07-0	1,2-Dichloroethane-D4	114%		73-122%
2037-26-5	Toluene-D8	105%		84-119%
460-00-4	4-Bromofluorobenzene	105%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	D-1R		
Lab Sample ID:	JC3254-24	**Date Sampled:**	09/07/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101450.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	86%		48-150%
111-27-3	Hexanol	90%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-31R(2)		
Lab Sample ID:	JC3254-25	**Date Sampled:**	09/07/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134380.D	10	09/12/15	BK	n/a	n/a	V2B5988
Run #2	2B134381.D	100	09/12/15	BK	n/a	n/a	V2B5988

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	100	33	ug/l	
71-43-2	Benzene	2.6	5.0	2.4	ug/l	J
100-41-4	Ethylbenzene	3740 [a]	100	27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	50	10	ug/l	
108-88-3	Toluene	ND	10	1.6	ug/l	
1330-20-7	Xylene (total)	ND	10	1.7	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%	102%	76-120%
17060-07-0	1,2-Dichloroethane-D4	111%	110%	73-122%
2037-26-5	Toluene-D8	105%	104%	84-119%
460-00-4	4-Bromofluorobenzene	105%	105%	78-117%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH101428.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-31R(2)		
Lab Sample ID:	JC3254-25	**Date Sampled:**	09/07/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101428.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	88%		48-150%
111-27-3	Hexanol	87%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-29R		
Lab Sample ID:	JC3254-26	**Date Sampled:**	09/07/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134382.D	1	09/12/15	BK	n/a	n/a	V2B5988
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		76-120%
17060-07-0	1,2-Dichloroethane-D4	112%		73-122%
2037-26-5	Toluene-D8	105%		84-119%
460-00-4	4-Bromofluorobenzene	107%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-29R		
Lab Sample ID:	JC3254-26	**Date Sampled:**	09/07/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101431.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	90%		48-150%
111-27-3	Hexanol	92%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	E-1R		
Lab Sample ID:	JC3254-27	**Date Sampled:**	09/07/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134383.D	1	09/12/15	BK	n/a	n/a	V2B5988
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	0.30	0.50	0.24	ug/l	J
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	0.75	1.0	0.17	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		76-120%
17060-07-0	1,2-Dichloroethane-D4	112%		73-122%
2037-26-5	Toluene-D8	106%		84-119%
460-00-4	4-Bromofluorobenzene	106%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	E-1R		
Lab Sample ID:	JC3254-27	**Date Sampled:**	09/07/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101432.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	89%		48-150%
111-27-3	Hexanol	93%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	G-1R(3)		
Lab Sample ID:	JC3254-28	**Date Sampled:**	09/07/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134477.D	200	09/15/15	BK	n/a	n/a	V2B5992
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	2000	660	ug/l	
71-43-2	Benzene	ND	100	47	ug/l	
100-41-4	Ethylbenzene	28200	200	54	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	1000	200	ug/l	
108-88-3	Toluene	96.0	200	32	ug/l	J
1330-20-7	Xylene (total)	85300	200	33	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		76-120%
17060-07-0	1,2-Dichloroethane-D4	113%		73-122%
2037-26-5	Toluene-D8	105%		84-119%
460-00-4	4-Bromofluorobenzene	102%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	G-1R(3)		
Lab Sample ID:	JC3254-28	**Date Sampled:**	09/07/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101433.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	88%		48-150%
111-27-3	Hexanol	92%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 2B134386.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-34		
Lab Sample ID:	JC3254-29	**Date Sampled:**	09/09/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

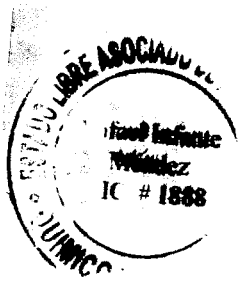
	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134386.D	1	09/12/15	BK	n/a	n/a	V2B5988
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		76-120%
17060-07-0	1,2-Dichloroethane-D4	114%		73-122%
2037-26-5	Toluene-D8	106%		84-119%
460-00-4	4-Bromofluorobenzene	105%		78-117%



ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-34		
Lab Sample ID:	JC3254-29	**Date Sampled:**	09/09/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101434.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	87%		48-150%
111-27-3	Hexanol	93%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 2B134387.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	EB090915		
Lab Sample ID:	JC3254-30	**Date Sampled:**	09/09/15
Matrix:	AQ - Equipment Blank	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134387.D	1	09/12/15	BK	n/a	n/a	V2B5988
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		76-120%
17060-07-0	1,2-Dichloroethane-D4	114%		73-122%
2037-26-5	Toluene-D8	105%		84-119%
460-00-4	4-Bromofluorobenzene	106%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 4M60585.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	EB090915		
Lab Sample ID:	JC3254-30	**Date Sampled:**	09/09/15
Matrix:	AQ - Equipment Blank	**Date Received:**	09/10/15
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	4M60585.D	1	09/18/15	SW	09/17/15	OP87266A	E4M2654
Run #2							

	Initial Volume	Final Volume
Run #1	960 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result		RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	J	0.10	0.014	ug/l	
208-96-8	Acenaphthylene	ND	J	0.10	0.012	ug/l	
120-12-7	Anthracene	ND	J	0.10	0.013	ug/l	
56-55-3	Benzo(a)anthracene	ND	J	0.052	0.019	ug/l	
50-32-8	Benzo(a)pyrene	ND	J	0.052	0.031	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	J	0.10	0.022	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	J	0.10	0.027	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	J	0.10	0.020	ug/l	
218-01-9	Chrysene	ND	J	0.10	0.016	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	J	0.10	0.037	ug/l	
206-44-0	Fluoranthene	ND	J	0.10	0.012	ug/l	
86-73-7	Fluorene	ND	J	0.10	0.028	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	J	0.10	0.032	ug/l	
91-20-3	Naphthalene	ND	J	0.10	0.014	ug/l	
85-01-8	Phenanthrene	ND	J	0.10	0.017	ug/l	
129-00-0	Pyrene	ND	J	0.10	0.014	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	79%		18-128%
321-60-8	2-Fluorobiphenyl	91%		13-124%
1718-51-0	Terphenyl-d14	50%		10-127%

(a) Sample extracted outside the holding time per client's request.

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
LIC # 1[illegible]
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	EB090915		
Lab Sample ID:	JC3254-30	**Date Sampled:**	09/09/15
Matrix:	AQ - Equipment Blank	**Date Received:**	09/10/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101437.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	89%		48-150%
111-27-3	Hexanol	93%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 2B134388.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	TB090915		
Lab Sample ID:	JC3254-31	**Date Sampled:**	09/09/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134388.D	1	09/12/15	BK	n/a	n/a	V2B5988
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		76-120%
17060-07-0	1,2-Dichloroethane-D4	115%		73-122%
2037-26-5	Toluene-D8	104%		84-119%
460-00-4	4-Bromofluorobenzene	106%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

GW
WTB

CHAIN OF CUSTODY

Fresh Ponds Corporate Village, Building B
2235 Route 130, Dayton, NJ 08810
732-329-0200 FAX: 732-329-3499/3480

FEDX # 8012 1953 5125

YN

Accutest Job #: JC3254
Accutest Quote #:

Client Information
Anderson Mulholland & Associates
Name: 2700 Westchester Avenue
Address: Purchase NY 10577
City / State / Zip
Terry Taylor
Send Report to:
Phone #: 914-251-0400

Facility Information
Anderson Mulholland
Project Name:
Location:
Project/PO #: B8B: Former Tank Farm
FAX #: 914-251-1286

Analytical Information

Field ID / Point of Collection	Collection Date	Time	Sampled By	Matrix	# of bottles	Preservation HCl	NaOH	H2SO4	HNO3	None	VOCs (Special List 2)		Ethylbenzene and Toluene (Special List 2)	PAH by 8270SIM	
MW-15	9/3/15	1152	NMR	GW	3	X					X	1			VI182
MW-17	"	1250	"	GW	3	X					X	2	X		
MW-5		1518		GW	3	X					X	3			
MW-14	9/3/15	1637	NMR	GW	3	X					X	4			
MW-				GW	3	X					X				
MW-				GW	3	X					X				
MW-				GW	3	X					X				
MW-				GW	3	X					X				
MW-				GW	3	X					X				
MW-				GW	3	X					X				
QC TB 030915	9/3/15	1637	NMR	QC	2	X					X	5			

INITIAL ASSESSMENT 2 AM
LABEL VERIFICATION

Turnaround Information
- [X] 21 Day Standard
- [ ] 14 Day
- [ ] 7 Days EMERGENCY
- [ ] Other _____ (Days)

Approved By:

RUSH TAT is for FAX data unless previously approved.

Data Deliverable Information
- [ ] NJ Reduced
- [X] NJ Full
- [ ] FULL CLP
- [ ] Disk Deliverable
- [ ] Other (Specify)
- [ ] Commercial "A"
- [ ] Commercial "B"
- [ ] ASP Category B
- [ ] State Forms

Comments / Remarks
Federal Express ID # 801219535125
Lab Trip Blank Date 9/2/15 Time 06:00
VOC's samples collected in 40 ml. glass vials, provided by the lab. Analyze for Special List 2 compounds (acetone, chloromethane, MIBK, methylene chloride and xylene). For MW-17/18 also analyze for ethylbenzene and toluene. For MW-12 also analyze for PAH. Also, please provide report on CD ROM.

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler: 1 Hector M Rivera	Date Time: 9/4/15/1101	Received By: 1 FEDX	Relinquished By: 2 FEDX	Date Time: 9/5/15 1000	Received By: 2				
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4				
Relinquished by Sampler: 5	Date Time:	Received By: 5	Seal # 198	Preserved where applicable: NONE Yes	On Ice: Yes	3.2°			

5.1
5

JC3254: Chain of Custody
Page 1 of 7

CHAIN OF CUSTODY

Fresh Ponds Corporate Village, Building B
2235 Route 130, Dayton, NJ 08810
732-329-0200 FAX: 732-329-3499/3480

Accutest Job #: JC3254
Accutest Quote #:

Client Information

Anderson Mulholland & Associates
Name: 2700 Westchester Avenue
Address: Purchase NY 10577
City / State / Zip
Send Report to: Terry Taylor
Phone #: 914-251-0400

Facility Information

Anderson Mulholland and Associates Inc.
Project Name: BMS: Building 5 Area
Location:
Project/PO #:
FAX #: 914-251-1286

Analytical Information

Field ID / Point of Collection	Collection Date	Collection Time	Sampled By	Matrix	# of bottles	Preservation HCL	Preservation NaOH	Preservation HNO3	Preservation H2SO4	Preservation None	VOCs (Special List 3)	
S-35	9/1/15	1545	NMR	GW	6	X					X	6
S-35 D	9/1/15	1547	NMR	GW	6	X					X	7
S-36	9/2/15	1132	NMR	GW	6	X					X	8
S-32	9/2/15	1702	NMR	GW	6	X					X	9
S-33	9/2/15	1558	NMR	GW	6	X					X	10
			NMR	GW	6	X					X	
			NMR	GW	6	X					X	
			NMR	GW	6	X					X	
			NMR	GW	6	X					X	
			NMR	GW	6	X					X	

Turnaround Information

- [X] 21 Day Standard — Approved By:
- [ ] 14 Day
- [ ] 7 Days EMERGENCY
- [ ] Other _____ (Days)

RUSH TAT is for FAX data unless previously approved.

Data Deliverable Information

- [ ] NJ Reduced
- [X] NJ Full
- [ ] FULL CLP
- [ ] Disk Deliverable
- [ ] Other (Specify)
- [ ] Commercial "A"
- [ ] Commercial "B"
- [ ] ASP Category B
- [ ] State Forms

Comments / Remarks

Federal Express ID # 801219535125
Lab Trip Blank Date 8/26/15 Time 06:00
VOC's samples collected in 40 ml. glass vials, provided by the lab. Analyze for Special List 3 compounds (acetone, benzene, ethylbenzene, toluene, MIBK, xylene, IPA and methanol). Also, please provide report on CD ROM.

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler	Date Time	Received By	Relinquished By	Date Time	Received By
1	Nestor M. Rivera	9/4/15 1101	1 FedEx	2 FedEx	9/5/15 1000	2
3			3	4		4
5			5	Seal # 198	Preserved where applicable: Yes	On Ice: Yes

5.1 5

GW
EB
WTB

CHAIN OF CUSTODY

Fresh Ponds Corporate Village, Building B
2235 Route 130, Dayton, NJ 08810
732-329-0200 FAX: 732-329-3499/3480

L

Accutest Job #: JC3254
Accutest Quote #:

Client Information
Anderson Mulholland & Associates
Name: 2700 Westchester Avenue
Address: Purchase NY 10577
City State Zip
Terry Taylor
Send Report to:
Phone #: 914-251-0400

Facility Information
Anderson Mulholland
Project Name:
Location:
Project/PO #: BMS: Former Tank Farm
FAX #: 914-251-1286

Analytical Information

Field ID / Point of Collection	Collection Date	Collection Time	Sampled By	Matrix	# of bottles	Preservation HCL	NaOH	HNO3	H2SO4	None	VOCs (Special List 2)		Ethylbenzene and Toluene (Special List 2)	PAH by 8270SIM					
MW-18	9/4/15	1738	NMR	GW	3	X					X	11		*					
MW-3	9/4/15	1841		GW	4	X					X	12							V3
MW-13	9/8/15	1305		GW	3	X					X	13							V4
MW-13D		1309		GW	3	X					X	14							E60
MW-7		1440		GW	3	X					X	15							
MW-16		1542		GW	3	X					X								
MW-16MS		1545		GW	3	X					X	16							
MW-16MSD	9/8/15	1547		GW	3	X					X								
MW-12	9/9/15	1542		GW	3	X					X	17		*					
MW-12D	9/9/15	1551		GW	3	X					X	18		*					
QC TB 090915	9/9/15	1551		QC	2	X					X	19							

* VOA QC trial

Turnaround Information
- [X] 21 Day Standard — Approved By:
- [ ] 14 Day
- [ ] 7 Days EMERGENCY — INITIAL ASESSMENT DA OR
- [ ] Other (Days) — LABEL VERIFICATION JK

RUSH TAT is for FAX data unless previously approved.

Data Deliverable Information
- [ ] NJ Reduced
- [X] NJ Full
- [ ] FULL CLP
- [ ] Disk Deliverable
- [ ] Other (Specify)
- [ ] Commercial "A"
- [ ] Commercial "B"
- [ ] ASP Category B
- [ ] State Forms

Comments / Remarks
Federal Express ID # 801219535114
Lab Trip Blank Date 8/26/15 Time 0600
VOC's samples collected in 40 ml. glass vials, provided by the lab. Analyze for Special List 2 compounds (acetone, chloromethane, MIBK, methylene chloride and xylene). For MW-17/18 also analyze for ethylbenzene and toluene. For MW-12 also analyze for PAH. Also, please provide report on CD ROM.

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Heather M. Privitera	9/9/15 1729	1 FEDEX	2 FEDEX	9-11-15 1440	2
3			3	4		4
5			5	Seal # 212, 214 Preserved where applicable: Yes	On Ice: Yes	2.7, 3.2, 2.4 8/10

5.1 5

CHAIN OF CUSTODY

Fresh Ponds Corporate Village, Building B
2235 Route 130, Dayton, NJ 08810
732-329-0200 FAX: 732-329-3499/3480

Accutest Job #: JC3254
Accutest Quote #:

Client Information

Anderson Mulholland & Associates
Name: 2700 Westchester Avenue
Address: Purchase NY 10577
City State Zip
Project Manager: Terry Taylor
Send Report to:
Phone #: 914-251-0400

Facility Information

Anderson Mulholland and Associates Inc.
Project Name:
Location:
Project/PO #: BMS: Building 5 Area
FAX #: 914-251-1286

Analytical Information

Field ID / Point of Collection	Collection Date	Collection Time	Sampled By	Matrix	# of bottles	Preservation HCl	Preservation NaOH	Preservation HNO3	Preservation H2SO4	Preservation None	VOCs (Special List 3)	
A-1R(4)	9/7/15	1246	NMR	GW	6	X					X	20
A-2R(2)		1330	NMR	GW	6	X					X	21
UP-1		1432	NMR	GW	6	X					X	22
UP-2	9/4/15	1616	NMR	GW	6	X					X	23
D-1R	9/7/15	1240	NMR	GW	6	X					X	24
S-31R(2)		1342	NMR	GW	6	X					X	
S-31R(2)MS		1346	NMR	GW	6	X					X	25
S-31R(2)MSD		1351	NMR	GW	6	X					X	
S-29R		1448	NMR	GW	6	X					X	26
E-1R		1623	NMR	GW	6	X					X	27
G-1R(3)	9/7/15	1731	NMR	GW	6	X					X	28

Turnaround Information

- [X] 21 Day Standard — Approved By:
- [ ] 14 Day
- [ ] 7 Days EMERGENCY
- [ ] Other _____ (Days)

RUSH TAT is for FAX data unless previously approved.

Data Deliverable Information

- [ ] NJ Reduced
- [X] NJ Full
- [ ] FULL CLP
- [ ] Disk Deliverable
- [ ] Other (Specify)
- [ ] Commercial "A"
- [ ] Commercial "B"
- [ ] ASP Category B
- [ ] State Forms

Comments / Remarks

Federal Express ID # 8012 1953 5114
Lab Trip Blank Date 8/26/15 Time 0600
VOC's samples collected in 40 ml. glass vials, provided by the lab. Analyze for Special List 3 compounds (acetone, benzene, ethylbenzene, toluene, MIBK, xylene, IPA and methanol). Also, please provide report on CD ROM.

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Heather M. Rivera	9/9/15 1729	1 FEDEX	2 FEDEX	9-10-15 1440	2
3			3	4		4
5			5	Seal # 212, 214	Preserved where applicable: Yes	On Ice: Yes

CHAIN OF CUSTODY

Fresh Ponds Corporate Village, Building B
2235 Route 130, Dayton, NJ 08810
732-329-0200 FAX: 732-329-3499/3480

Accutest Job #: JC3254
Accutest Quote #:

Client Information

Anderson Mulholland & Associates
Name: 2700 Westchester Avenue
Address: Purchase NY 10577
City State Zip
Send Report to: Terry Taylor
Phone #: 914-251-0400

Facility Information

Anderson Mulholland and Associates Inc.
Project Name:
Location:
Project/PO #: BMS: Building 5 Area
FAX #: 914-251-1286

Analytical Information

Field ID / Point of Collection	Collection Date	Collection Time	Sampled By	Matrix	# of bottles	Preservation HCl	Preservation NaOH	Preservation HNO3	Preservation H2SO4	Preservation None	VOCs (Special List 3)										
S-34	9/9/15	1311	NMR	GW	6	X					X	29									
FB090915	9/9/15	1058	NMR	GW	6	X					X	30									
			NMR	GW	6	X					X										
			NMR	GW	6	X					X										
			NMR	GW	6	X					X										
			NMR	GW	6	X					X										
			NMR	GW	6	X					X										
			NMR	GW	6	X					X										
			NMR	GW	6	X					X										
			NMR	GW	6	X					X										
TB090915	9/9/15	1551	NMR	W	2	X					X	31									

Turnaround Information

- [X] 21 Day Standard — Approved By:
- [ ] 14 Day
- [ ] 7 Days EMERGENCY
- [ ] Other _____ (Days)

RUSH TAT is for FAX data unless previously approved.

Data Deliverable Information

- [ ] NJ Reduced
- [X] NJ Full
- [ ] FULL CLP
- [ ] Disk Deliverable
- [ ] Other (Specify)
- [ ] Commercial "A"
- [ ] Commercial "B"
- [ ] ASP Category B
- [ ] State Forms

Comments / Remarks

Federal Express ID # _____
Lab Trip Blank Date_____ Time _____
VOC's samples collected in 40 ml. glass vials, provided by the lab. Analyze for Special List 3 compounds (acetone, benzene, ethylbenzene, toluene, MIBK, xylene, IPA and methanol). Also, please provide report on CD ROM.

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Justin M Rivera	9/9/15 1729	Fedex	FEDEX	9-10-15 1440	
2						
3						
4						
5						

Seal # 212, 214 Preserved where applicable: Yes On Ice: yes

5.1 5

Raw Data: 2D147903.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	MW-15		
Lab Sample ID:	JC3254-1	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D147903.D	1	09/09/15	BK	n/a	n/a	V2D6208
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%		76-120%
17060-07-0	1,2-Dichloroethane-D4	111%		73-122%
2037-26-5	Toluene-D8	112%		84-119%
460-00-4	4-Bromofluorobenzene	109%		78-117%

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Rafael Infante Méndez
LIC # 1888
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 2B134317.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	MW-17		
Lab Sample ID:	JC3254-2	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134317.D	1	09/10/15	BK	n/a	n/a	V2B5985
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		76-120%
17060-07-0	1,2-Dichloroethane-D4	105%		73-122%
2037-26-5	Toluene-D8	105%		84-119%
460-00-4	4-Bromofluorobenzene	102%		78-117%

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ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 2B134408.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	MW-5		
Lab Sample ID:	JC3254-3	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134408.D	1	09/12/15	BK	n/a	n/a	V2B5989
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	6.1	10	3.3	ug/l	J
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
1330-20-7	Xylene (total)	11.4	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		76-120%
17060-07-0	1,2-Dichloroethane-D4	111%		73-122%
2037-26-5	Toluene-D8	104%		84-119%
460-00-4	4-Bromofluorobenzene	103%		78-117%

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ND = Not detected MDL = Method Detection Limit
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J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	MW-14		
Lab Sample ID:	JC3254-4	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134319.D	1	09/10/15	BK	n/a	n/a	V2B5985
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
1330-20-7	Xylene (total)	0.61	1.0	0.17	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		76-120%
17060-07-0	1,2-Dichloroethane-D4	102%		73-122%
2037-26-5	Toluene-D8	105%		84-119%
460-00-4	4-Bromofluorobenzene	102%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 2B134320.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	QC TB 030915		
Lab Sample ID:	JC3254-5	**Date Sampled:**	09/03/15
Matrix:	AQ - Trip Blank Water	**Date Received:**	09/05/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134320.D	1	09/10/15	BK	n/a	n/a	V2B5985
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		76-120%
17060-07-0	1,2-Dichloroethane-D4	103%		73-122%
2037-26-5	Toluene-D8	105%		84-119%
460-00-4	4-Bromofluorobenzene	101%		78-117%

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IC # 1[illegible]

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 2D147889.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-35		
Lab Sample ID:	JC3254-6	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D147889.D	1	09/09/15	BK	n/a	n/a	V2D6208
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		76-120%
17060-07-0	1,2-Dichloroethane-D4	109%		73-122%
2037-26-5	Toluene-D8	113%		84-119%
460-00-4	4-Bromofluorobenzene	112%		78-117%

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IC # 1886
QUIMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: GH101438.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-35		
Lab Sample ID:	JC3254-6	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101438.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	86%		48-150%
111-27-3	Hexanol	88%		48-150%

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IC # 1888
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ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-35D		
Lab Sample ID:	JC3254-7	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D147890.D	1	09/09/15	BK	n/a	n/a	V2D6208
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		76-120%
17060-07-0	1,2-Dichloroethane-D4	108%		73-122%
2037-26-5	Toluene-D8	112%		84-119%
460-00-4	4-Bromofluorobenzene	111%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-35D		
Lab Sample ID:	JC3254-7	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101439.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	87%		48-150%
111-27-3	Hexanol	90%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-36		
Lab Sample ID:	JC3254-8	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2D147891.D	1	09/09/15	BK	n/a	n/a	V2D6208
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		76-120%
17060-07-0	1,2-Dichloroethane-D4	110%		73-122%
2037-26-5	Toluene-D8	112%		84-119%
460-00-4	4-Bromofluorobenzene	112%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-36		
Lab Sample ID:	JC3254-8	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101440.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	86%		48-150%
111-27-3	Hexanol	90%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-32		
Lab Sample ID:	JC3254-9	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134560.D	100	09/17/15	BK	n/a	n/a	V2B5996
Run #2	2B134561.D	1000	09/17/15	BK	n/a	n/a	V2B5996

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	1000	330	ug/l	
71-43-2	Benzene	ND	50	24	ug/l	
100-41-4	Ethylbenzene	44800 [a]	1000	270	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	500	100	ug/l	
108-88-3	Toluene	49.7	100	16	ug/l	J
1330-20-7	Xylene (total)	71900 [a]	1000	170	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%	105%	76-120%
17060-07-0	1,2-Dichloroethane-D4	119%	119%	73-122%
2037-26-5	Toluene-D8	105%	103%	84-119%
460-00-4	4-Bromofluorobenzene	104%	103%	78-117%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-32		
Lab Sample ID:	JC3254-9	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101441.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	87%		48-150%
111-27-3	Hexanol	102%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-33		
Lab Sample ID:	JC3254-10	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134438.D	1	09/14/15	BK	n/a	n/a	V2B5990
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		76-120%
17060-07-0	1,2-Dichloroethane-D4	111%		73-122%
2037-26-5	Toluene-D8	106%		84-119%
460-00-4	4-Bromofluorobenzene	104%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	S-33		
Lab Sample ID:	JC3254-10	**Date Sampled:**	09/03/15
Matrix:	AQ - Ground Water	**Date Received:**	09/05/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101442.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	85%		48-150%
111-27-3	Hexanol	90%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 2B134478.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	MW-18		
Lab Sample ID:	JC3254-11	**Date Sampled:**	09/04/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134478.D	1	09/15/15	BK	n/a	n/a	V2B5992
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
108-88-3	Toluene	0.31	1.0	0.16	ug/l	J
1330-20-7	Xylene (total)	2.4	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		76-120%
17060-07-0	1,2-Dichloroethane-D4	114%		73-122%
2037-26-5	Toluene-D8	105%		84-119%
460-00-4	4-Bromofluorobenzene	103%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	MW-3		
Lab Sample ID:	JC3254-12	**Date Sampled:**	09/04/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134538.D	1	09/16/15	BK	n/a	n/a	V2B5994
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
1330-20-7	Xylene (total)	1.9	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		76-120%
17060-07-0	1,2-Dichloroethane-D4	113%		73-122%
2037-26-5	Toluene-D8	103%		84-119%
460-00-4	4-Bromofluorobenzene	100%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	MW-13		
Lab Sample ID:	JC3254-13	**Date Sampled:**	09/08/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

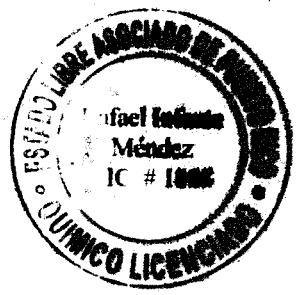
	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134439.D	1	09/14/15	BK	n/a	n/a	V2B5990
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		76-120%
17060-07-0	1,2-Dichloroethane-D4	112%		73-122%
2037-26-5	Toluene-D8	104%		84-119%
460-00-4	4-Bromofluorobenzene	103%		78-117%



ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 2B134536.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	MW-13D		
Lab Sample ID:	JC3254-14	**Date Sampled:**	09/08/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

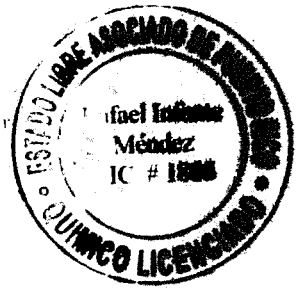
	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134536.D	1	09/16/15	BK	n/a	n/a	V2B5994
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		76-120%
17060-07-0	1,2-Dichloroethane-D4	112%		73-122%
2037-26-5	Toluene-D8	103%		84-119%
460-00-4	4-Bromofluorobenzene	104%		78-117%



ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	MW-7		
Lab Sample ID:	JC3254-15	**Date Sampled:**	09/08/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134537.D	1	09/16/15	BK	n/a	n/a	V2B5994
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
1330-20-7	Xylene (total)	32.3	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		76-120%
17060-07-0	1,2-Dichloroethane-D4	113%		73-122%
2037-26-5	Toluene-D8	102%		84-119%
460-00-4	4-Bromofluorobenzene	103%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID:	MW-16		
Lab Sample ID:	JC3254-16	**Date Sampled:**	09/08/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134400.D	1	09/12/15	BK	n/a	n/a	V2B5989
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		76-120%
17060-07-0	1,2-Dichloroethane-D4	113%		73-122%
2037-26-5	Toluene-D8	104%		84-119%
460-00-4	4-Bromofluorobenzene	104%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	MW-12		
Lab Sample ID:	JC3254-17	**Date Sampled:**	09/09/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134401.D	1	09/12/15	BK	n/a	n/a	V2B5989
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
100-41-4	Ethylbenzene	2.3	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
108-88-3	Toluene	0.19	1.0	0.16	ug/l	J
1330-20-7	Xylene (total)	0.65	1.0	0.17	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		76-120%
17060-07-0	1,2-Dichloroethane-D4	115%		73-122%
2037-26-5	Toluene-D8	106%		84-119%
460-00-4	4-Bromofluorobenzene	102%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 3M57746.D 4M60722.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	MW-12		
Lab Sample ID:	JC3254-17	**Date Sampled:**	09/09/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3M57746.D	1	09/17/15	LK	09/15/15	OP87215A	E3M2675
Run #2 [a]	4M60722.D	1	09/24/15	LK	09/18/15	OP87321A	E4M2661

	Initial Volume	Final Volume
Run #1	900 ml	1.0 ml
Run #2	950 ml	1.0 ml

BN PAH List

CAS No.	Compound	Result		RL	MDL	Units	Q
83-32-9	Acenaphthene	0.350		0.11	0.015	ug/l	
208-96-8	Acenaphthylene	ND		0.11	0.013	ug/l	
120-12-7	Anthracene	ND	J	0.11	0.014	ug/l	
56-55-3	Benzo(a)anthracene	ND		0.056	0.021	ug/l	
50-32-8	Benzo(a)pyrene	ND		0.056	0.033	ug/l	
205-99-2	Benzo(b)fluoranthene	ND		0.11	0.023	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND		0.11	0.029	ug/l	
207-08-9	Benzo(k)fluoranthene	ND		0.11	0.021	ug/l	
218-01-9	Chrysene	ND		0.11	0.017	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND		0.11	0.039	ug/l	
206-44-0	Fluoranthene	ND		0.11	0.012	ug/l	
86-73-7	Fluorene	1.05		0.11	0.030	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND		0.11	0.035	ug/l	
91-20-3	Naphthalene	1.57		0.11	0.015	ug/l	
85-01-8	Phenanthrene	0.251		0.11	0.018	ug/l	
129-00-0	Pyrene	ND		0.11	0.015	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	2% [c]	0% [b]	18-128%
321-60-8	2-Fluorobiphenyl	59%	72%	13-124%
1718-51-0	Terphenyl-d14	22%	36%	10-127%

(a) Confirmation run for surrogate recoveries.
(b) Outside control limits due to matrix interference.
(c) Outside control limits due to matrix interference. Confirmed by re-extraction.

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ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	MW-12D		
Lab Sample ID:	JC3254-18	**Date Sampled:**	09/09/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134402.D	1	09/12/15	BK	n/a	n/a	V2B5989
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
100-41-4	Ethylbenzene	2.3	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
108-88-3	Toluene	0.17	1.0	0.16	ug/l	J
1330-20-7	Xylene (total)	0.66	1.0	0.17	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		76-120%
17060-07-0	1,2-Dichloroethane-D4	113%		73-122%
2037-26-5	Toluene-D8	106%		84-119%
460-00-4	4-Bromofluorobenzene	102%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 3M57747.D 4M60723.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	MW-12D		
Lab Sample ID:	JC3254-18	**Date Sampled:**	09/09/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3M57747.D	1	09/17/15	LK	09/15/15	OP87215A	E3M2675
Run #2 [a]	4M60723.D	1	09/24/15	LK	09/18/15	OP87321A	E4M2661

	Initial Volume	Final Volume
Run #1	950 ml	1.0 ml
Run #2	950 ml	1.0 ml

BN PAH List

CAS No.	Compound	Result		RL	MDL	Units	Q
83-32-9	Acenaphthene	0.351		0.11	0.014	ug/l	
208-96-8	Acenaphthylene	ND		0.11	0.012	ug/l	
120-12-7	Anthracene	ND	J	0.11	0.014	ug/l	
56-55-3	Benzo(a)anthracene	ND		0.053	0.019	ug/l	
50-32-8	Benzo(a)pyrene	ND		0.053	0.031	ug/l	
205-99-2	Benzo(b)fluoranthene	ND		0.11	0.022	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND		0.11	0.028	ug/l	
207-08-9	Benzo(k)fluoranthene	ND		0.11	0.020	ug/l	
218-01-9	Chrysene	ND		0.11	0.016	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND		0.11	0.037	ug/l	
206-44-0	Fluoranthene	0.116		0.11	0.012	ug/l	
86-73-7	Fluorene	1.07		0.11	0.028	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND		0.11	0.033	ug/l	
91-20-3	Naphthalene	1.66		0.11	0.014	ug/l	
85-01-8	Phenanthrene	0.296		0.11	0.017	ug/l	
129-00-0	Pyrene	ND		0.11	0.014	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	2% [c]	0% [b]	18-128%
321-60-8	2-Fluorobiphenyl	56%	78%	13-124%
1718-51-0	Terphenyl-d14	26%	33%	10-127%

(a) Confirmation run for surrogate recoveries.
(b) Outside control limits due to matrix interference.
(c) Outside control limits due to matrix interference. Confirmed by re-extraction.

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ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Raw Data: 2B134403.D

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	QC TB 090915		
Lab Sample ID:	JC3254-19	**Date Sampled:**	09/09/15
Matrix:	AQ - Trip Blank Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134403.D	1	09/12/15	BK	n/a	n/a	V2B5989
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
74-87-3	Chloromethane	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.73	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		76-120%
17060-07-0	1,2-Dichloroethane-D4	110%		73-122%
2037-26-5	Toluene-D8	103%		84-119%
460-00-4	4-Bromofluorobenzene	104%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	A-IR(4)		
Lab Sample ID:	JC3254-20	**Date Sampled:**	09/04/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134480.D	25	09/15/15	BK	n/a	n/a	V2B5992
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	83	ug/l	
71-43-2	Benzene	ND	13	5.9	ug/l	
100-41-4	Ethylbenzene	2820	25	6.7	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	130	25	ug/l	
108-88-3	Toluene	49.1	25	4.1	ug/l	
1330-20-7	Xylene (total)	9490	25	4.1	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		76-120%
17060-07-0	1,2-Dichloroethane-D4	111%		73-122%
2037-26-5	Toluene-D8	106%		84-119%
460-00-4	4-Bromofluorobenzene	105%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	A-IR(4)		
Lab Sample ID:	JC3254-20	**Date Sampled:**	09/04/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101443.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	79%		48-150%
111-27-3	Hexanol	83%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	A-2R(2)		
Lab Sample ID:	JC3254-21	**Date Sampled:**	09/04/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134390.D	1	09/12/15	BK	n/a	n/a	V2B5988
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	19.9	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	0.68	1.0	0.16	ug/l	J
1330-20-7	Xylene (total)	89.8	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		76-120%
17060-07-0	1,2-Dichloroethane-D4	116%		73-122%
2037-26-5	Toluene-D8	105%		84-119%
460-00-4	4-Bromofluorobenzene	104%		78-117%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	A-2R(2)		
Lab Sample ID:	JC3254-21	**Date Sampled:**	09/04/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846-8015C (DAI)	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH101444.D	1	09/14/15	XPL	n/a	n/a	GGH5006
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	25	ug/l	
67-56-1	Methanol	ND	200	45	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	86%		48-150%
111-27-3	Hexanol	89%		48-150%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest LabLink@874797 09:10 28-Sep-2015

Report of Analysis

Client Sample ID:	VP-1 UP-1N		
Lab Sample ID:	JC3254-22	**Date Sampled:**	09/04/15
Matrix:	AQ - Ground Water	**Date Received:**	09/10/15
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	BMSMC, Former Tank Farm, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2B134391.D	1	09/12/15	BK	n/a	n/a	V2B5988
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.3	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
100-41-4	Ethylbenzene	3.7	1.0	0.27	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.0	ug/l	
108-88-3	Toluene	ND	1.0	0.16	ug/l	
1330-20-7	Xylene (total)	3.7	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		76-120%
17060-07-0	1,2-Dichloroethane-D4	115%		73-122%
2037-26-5	Toluene-D8	104%		84-119%
460-00-4	4-Bromofluorobenzene	106%		78-117%

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Rafael Infante Méndez
IC # [redacted]
QUÍMICO LICENCIADO

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Project Number:____JC3254_____
Date:_____09/09-05/2015_____

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: USEPA Region 2, SOP HW-24, Standard Operating Procedure for the Validation of Organic Data Acquired using SW-846 Method 8260B (August, 2009-Revision 2), the USEPA National Functional Guidelines for Low/Medium Concentration Organic Data Review (SOW SOM01.2 SOP HW-33, August 2009 – Revision 2), the USEPA National Functional Guidelines for Organic Data Review for Low Concentration Water (SOP HW-13, August, 2009-Revision 3). Also, QC criteria from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8260B are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __JC3254_____ Sample matrix: ___Groundwater_____
No. of Samples: _____35_____

Trip blank No.: ___JC3254-5;_JC3254-19;_JC3254-31_____
Field blank No.: _____-_____
Equipment blank No.:_____JC3254-30_____
Field duplicate No.:____JC3254-13/JC3254-14;_JC3254-17/JC3254-18_____

___X___ Data Completeness
___X___ Holding Times
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_Selected_VOC's_by_SW846-8260C_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:_____09/29/2015_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X___
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
All samples analyzed within the recommended method holding time				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 14 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 3.4 °C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __X___
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__X___ The BFB performance results were reviewed and found to be within the specified criteria.

__X___ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected:
_____

If mass calibration is in error, all associated data are rejected.

All criteria were met __X__
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____07/24/15_____
Dates of continuing calibration:_09/10/15;_09/11/15;_09/12/15;_09/14/15;_09/15/15;_____
_09/16/15;_09/17/15_____
Instrument ID numbers:_____GCM2B_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and continuing calibration meets method performance criteria.				

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r < 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met __X___
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
____All_method_blank_meeth_method_specific_criteria_____				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

_No_target_analytes_detected_in_the_trip/equipment_blanks_analyzed_as_part_of_this_data___
_package._No_field_blank_analyzed_with_this_data_package._____

All criteria were met ___X___
Criteria were not met
and/or see below _____

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met __X__
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND				ACTION
	1,2-DCA	DBFM	TOL-d8	BFB	
_All_surrogate_recoveries_within_laboratory_control_limits					

QC Limits* (Aqueous)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Low)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Med)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____

1,2-DCA = 1,2-Dichloromethane-d4
DBFM = Dibromofluoromethane
TOL-d8 = Toluene-d8
BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:
If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.
If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met _____
Criteria were not met
and/or see below ___X___

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC3254-25MS/-25MSD_____ Matrix/Level:___GROUNDWATER_____
Sample ID:__JC3254-16MS/-16MSD_____ Matrix/Level:___GROUNDWATER_____
Sample ID:__JC3254-20MS/-20MSD_____ Matrix/Level:___GROUNDWATER_____
Sample ID:__JB3254-6MS_____ Matrix/Level:___GROUNDWATER_____
Sample ID:__JB3137-3MS/-3MSD_____ Matrix/Level:___GROUNDWATER_____

MS OR MSD COMPOUND % R RPD QC LIMITS ACTION

_MS/MSD-recoveries_and_RPD_within_laboratory_control_limits_except_for_the_following:_____

JC3254-25MS/-25MSD
_MS/MSD_____ETHYLBENZENE___-32/-38_____38_-_139_____No_action_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met _____
Criteria were not met
and/or see below ___X___

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC3538-8MS/-8MSD_____ Matrix/Level:___GROUNDWATER_____
Sample ID:__JC3669-14MS/-14MSD_____ Matrix/Level:___GROUNDWATER_____
Sample ID:__JB3795-7MS/-7MSD_____ Matrix/Level:___GROUNDWATER_____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION
_MS/MSD-recoveries_and_RPD_within_laboratory_control_limits_except_for_the_following:_____					
JC3795-7MS/-7MSD _MS/MSD_____	BENZENE_____	-62/-56_____		43_-_138_____	No_action_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____ Matrix/Level/Unit:_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met __X__
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

___Recoveries_(blank_spike)_within_laboratory_control_limits_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met __X___
Criteria were not met
and/or see below _____

IX. FIELD DUPLICATE PRECISION

Sample IDs: __JC3254-6/JC3254-7____ Matrix:_Groundwater__
Sample IDs: __JC3254-13/JC3254-14__ Matrix:_Groundwater__
Sample IDs: __JC3254-17/JC3254-18__ Matrix:_Groundwater__

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
RPD within laboratory and generally acceptable control limits.					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __X__
Criteria were not met
and/or see below _____

IX. LABORATORY DUPLICATE PRECISION

Sample IDs: ___JC3254-7_____ Matrix:_Groundwater__

Field/laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
RPD within laboratory and generally acceptable control limits.					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met _X_
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

_Internal_standard_area_within_laboratory_control_limits_____

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met _X___
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC3254-3

Ethylbenzene RF = 1.197

[ ] = (30379)(50)/(365642)(1.197)

= 3.47 ppb OK

All criteria were met _X___
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION
JC3254-9	100 X; 1000 X	Analytes outside calibration range
JC3254-20	25 X	Analytes outside calibration range
JC3254-25	200 X	Ethylbenzene outside calibration range
JC3254-28	200 X	Analytes outside calibration range

B. Percent Solids

List samples which have $\leq$ 50 % solids

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)

Project Number:___JC3254_____
Date:_____09/03-09/2015_____

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: USEPA Region 2, SOP HW-24, Standard Operating Procedure for the Validation of Organic Data Acquired using SW-846 Method 8260B (August, 2009-Revision 2), the USEPA National Functional Guidelines for Low/Medium Concentration Organic Data Review (SOW SOM01.2 SOP HW-33, August 2009 – Revision 2), the USEPA National Functional Guidelines for Organic Data Review for Low Concentration Water (SOP HW-13, August, 2009-Revision 3). Also, QC criteria from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996)," specifically for Methods 8000/8260B are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __JC3254_____ Sample matrix: ___Groundwater_____
No. of Samples: _____18_____

Trip blank No.: _____-_____
Field blank No.: _____-_____
Equipment blank No.:__JC3254-30_____
Field duplicate No.:____-_____

___X___ Data Completeness
___X___ Holding Times
___N/A_ GC/MS Tuning
___N/A_ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_Selected_alcohols_(Isopropyl_alcohol_and_Methanol)_by_SW-846_8015C_(DAI)_____

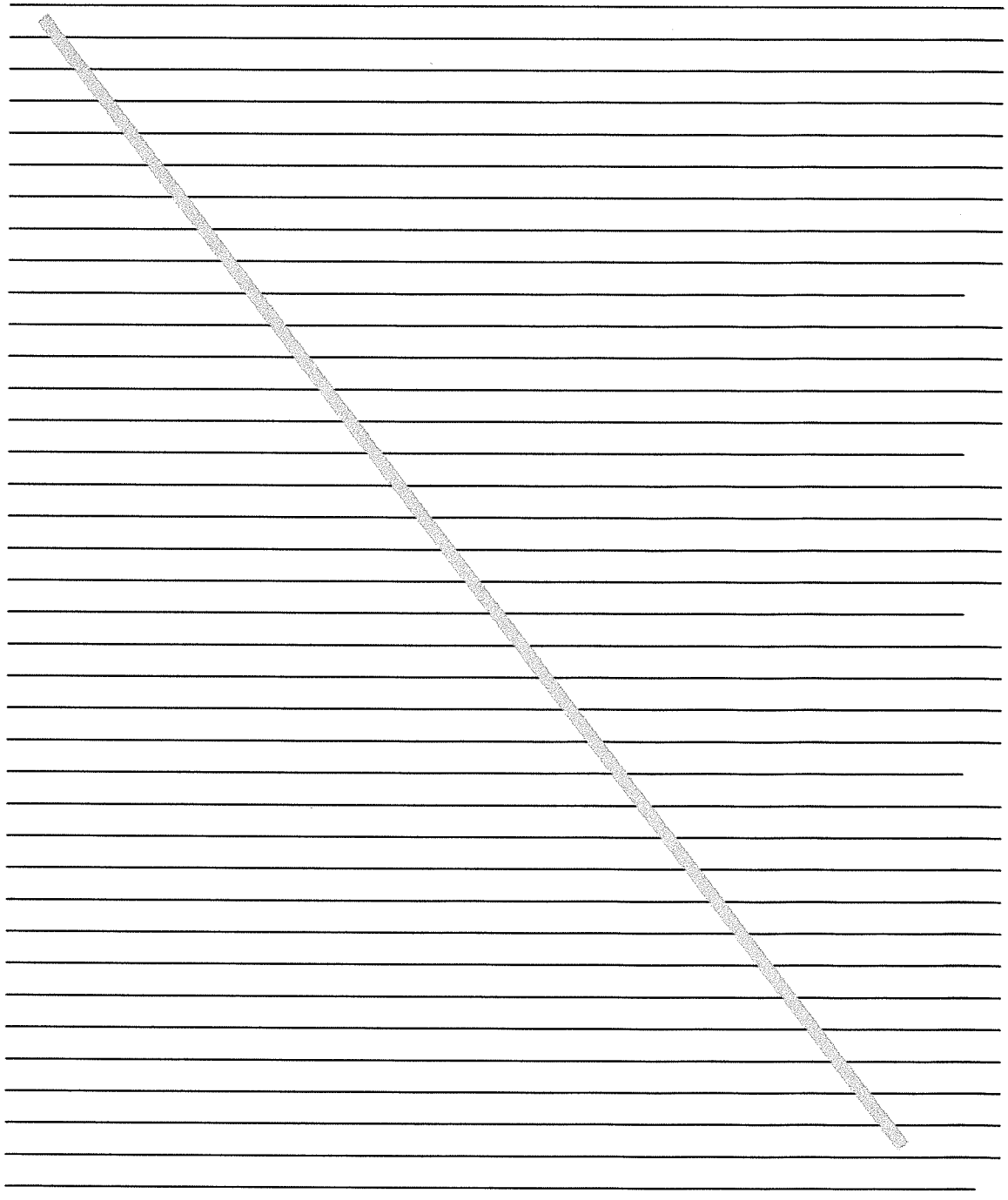
Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:__09/29/2015_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED



All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
All samples analyzed within the recommended method holding time				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 4°C

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __N/A__
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__N/A_ The BFB performance results were reviewed and found to be within the specified criteria.

__N/A_ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected:

_____

If mass calibration is in error, all associated data are rejected.

All criteria were met __X__
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____05/20/15_____
Dates of continuing calibration:_09/14/15_____
Instrument ID number:_____GCGH_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and continuing calibration meet method specific criteria				

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be $\leq$ 15 % regardless of method requirements for CCC.
All %Ds must be $\leq$ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of $\geq$ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
All_method_blank_meeth_method_specific_criteria				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS

_No_target_analytes_detected_in_the_equipment_blank. _No_trip/field_blanks_analyzed_____
_with_this_data_package.

All criteria were met __X__
Criteria were not met
and/or see below _____

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met ___X___
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND				ACTION
	Hexanol	~~DBFM~~	~~TOL-d8~~	~~BFB~~	
_All_surrogate_recoveries_within_laboratory_control_limits._____					

QC Limits* (Aqueous)
_____LL_to_UL___ _48_to_150_ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Low)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Med)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____

1,2-DCA = 1,2-Dichloromethane-d4 TOL-d8 = Toluene-d8
DBFM = Dibromofluoromethane BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:

If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.
If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met __X___
Criteria were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC3254-25MS/25MSD_____ Matrix/Level:___Groundwater_____

MS OR MSD	COMPOUND	% R	RPD	QC LIMITS	ACTION

Note: MS/MSD recoveries and RPD within laboratory control limits.

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____ Matrix/Level/Unit:_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met __X__
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

___Recoveries_within_laboratory_control_limits._____
_____
_____
_____
_____
_____
_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met ___X___
Criteria were not met
and/or see below _____

IX. FIELD/LABORATORY DUPLICATE PRECISION

Sample IDs: _JC3254-6/JC3254-7___ Matrix:____Groundwater_____

Field/laboratory duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD $\pm$ 30% for aqueous samples, RPD $\pm$ 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
RPD within laboratory and generally acceptable control limits.					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X___
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

Blank Spike

Methanol RF = 14.57

[ ] = (86071)/(14.87)

= 5907 ppb OK

Project Number:____JC3254_____
Date:____09/03-09/2015_____

REVIEW OF SEMIVOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence *Data Validation Standard Operating Procedure for Organic Analysis of Low/Medium Concentration Semivolatile Acquired using SW-846 Method 8270C* (SOW SOM01.2- SOP HW-35, August 2009 –Revision 1); Validating Semivolatile Organic Compounds by GC/MS, SW846 8270D (SOP HW-22, August, 2009 – Revision 4) (noted herein as the "primary guidance document"), Also, QC criteria from *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update IV, December 1998),"* specifically for *Methods 8000/8270D* are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __JC3254_____ Sample matrix: ___Groundwater_____
No. of Samples: _____3_____

Trip blank No.: ___-_____
Field blank No.: ___-_____
Equipment blank No.:__JC3254-30_____
Field duplicate No.:_____JC3254-17/JC3254-18_____

___X___ Data Completeness
___X___ Holding Times
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

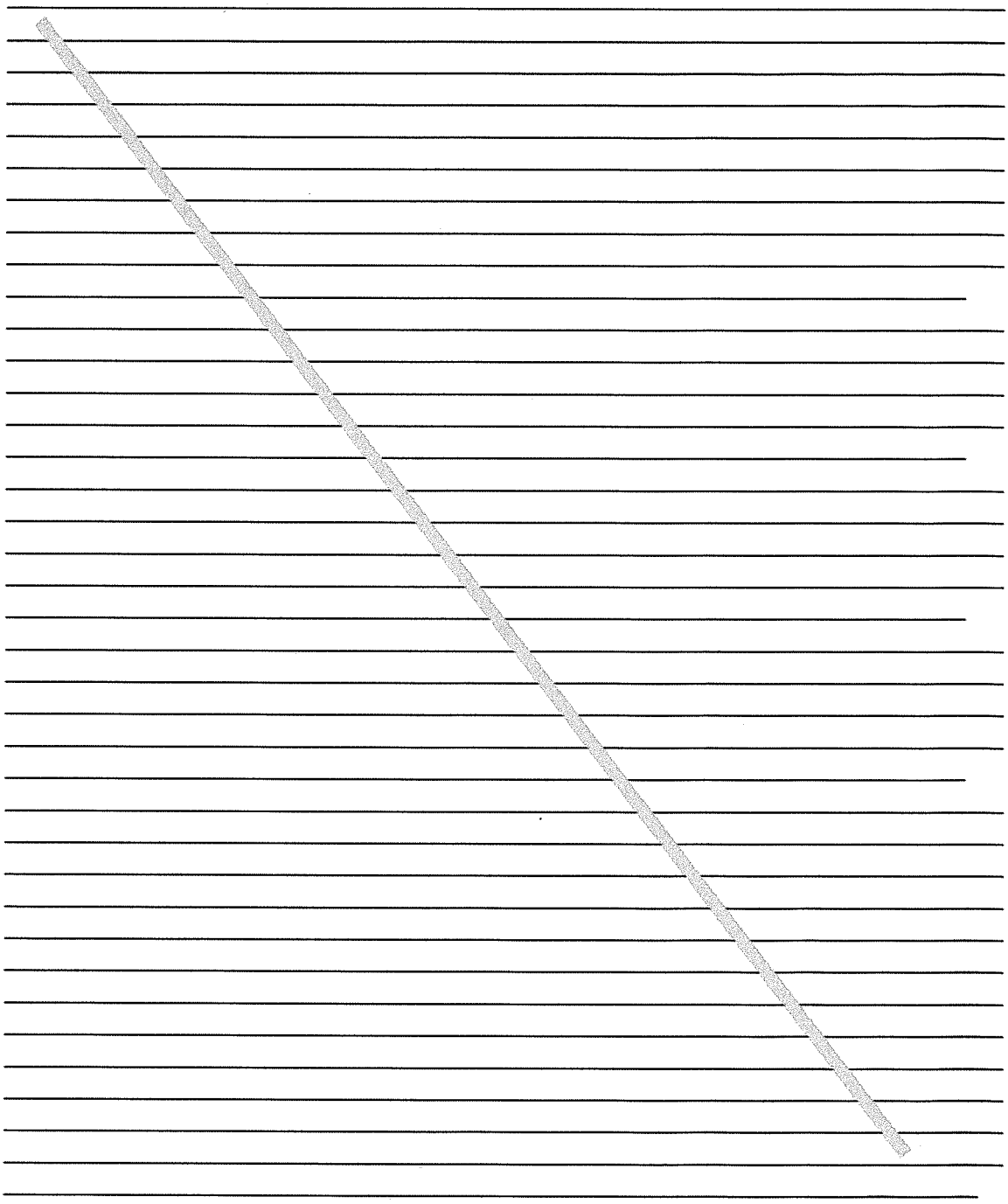
Overall Comments:_SVOCs_(PAHs)_SW856-8270D_SIM_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:__09/30/2015_____

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED



All criteria were met ____
Criteria were not met
and/or see below __X__

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
All samples extracted and analyzed within the recommended method holding time except for the following				
JC3254-30	09/09/2015	09/17/2015	-	Results qualified as estimated (J).

Criteria

Soil samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Soil samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Aqueous samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 2.3°C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __X__
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__X_ The DFTPP performance results were reviewed and found to be within the specified criteria.

__X_ DFTPP tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected:
_____

If mass calibration is in error, all associated data are rejected.

All criteria were met ___X___
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____09/04/15_____
Dates of continuing calibration:__09/17/15_____
Instrument ID numbers:___GCMS3M_____
Matrix/Level:_Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and continuing calibration meet method specific requirements for target analytes				

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met ___X___
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____09/10/15_____
Dates of continuing calibration:__09/17/15;_09/24/15_____
Instrument ID numbers:_____GCMS4M_____
Matrix/Level:_____Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, %D, r	COMPOUND	SAMPLES AFFECTED
Initial and continuing calibration meet method specific requirements for target analytes				

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be ≤ 15 % regardless of method requirements for CCC.
All %Ds must be ≤ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of ≥ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
All_method_blank_meeth_method_specific_criteria				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
_No_field_blank_analyzed_as_part_of_this_data_package.				
_Target_analytes_not_detected_above_reporting_limits_in_the_equipment_blank_analyzed_with_ _this_data_package.				

All criteria were met ____
Criteria were not met
and/or see below __X__

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/Soil

SAMPLE ID	SURROGATE COMPOUND			ACTION
	S1	S2	S3	
_Surrogate_recoveries_within_laboratory_control_limits_except_for_the_followings__				
_JC3254-17	0			No_action
_JC3254-17	2			No_action
_JC3254-18	0			No_action
_JC3254-18	2			No_action

Note: **Outside control limits due to matrix interference. Confirmed by re-extraction.**

QC Limits* (Aqueous)				
LL_to_UL	_18_to_128_	_13_to_124_	_10_to_127_	___to_____
QC Limits* (Solid-Low)				
LL_to_UL	____to_____	___to_____	___to_____	___to_____
QC Limits* (Solid-Med)				
LL_to_UL	____to_____	___to_____	___to_____	___to_____

S1 - Nitrobenzene-d5
S2 - 2-Fluorobiphenyl S3 - Terphenyl-d14

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for Aqueous and 70 – 130 % for solid/soil samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:
If one or more surrogate in the SVOC fraction is out of specification, but has a recovery of > 10%.
If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met _____
Criteria were not met
and/or see below ___X___

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed.

List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JC3769-2_MS/MSD_(SVOCs)____ Matrix/Level:__Aqueous___
Sample ID:__JC3875-1_MS/MSD_(SVOCs)____ Matrix/Level:__Aqueous___

MS OR MSD COMPOUND % R RPD QC LIMITS ACTION

MS/MSD_and_RPD_within_laboratory_control_limits_except_for_the_following_____
_JC-3769-2___

_MS/MSD_____Anthracene_____0%/0%___-___40_-_152_____Qualify_results_(J)__
_MSD_____Chrysene_____26%___-___31_-_143_____No_action_____
_MS/MSD_____Fluoranthene_____0%/0%___-___42_-_139_____No_action*_____
_MS/MSD_____Phenanthrene_____0%/0%__-___38_-_146_____No_action*_____
_MS/MSD_____Pyrene_____0%/0%__-___37_-_148_____No_action*_____

Note: *- **Outside control limits due to high level in sample relative to spike amount.**

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
ondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).

If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).

If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __N/A___
Criteria were not met
and/or see below _____

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____ Matrix/Level/Unit:_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met __X__
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID COMPOUND % R QC LIMIT

___Recoveries_within_laboratory_control_limits._____
_____
_____
_____
_____
_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met __X___
Criteria were not met
and/or see below _____

IX. FIELD DUPLICATE PRECISION

Sample IDs: ___ JC3254-17/JC3254-18__ Matrix:_Groundwater_____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.

Suggested criteria: RPD ± 30% for Aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
RPD within laboratory and generally acceptable control limits for analytes detected at concentrations > 5 SQL					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __X___
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Internal standard within laboratory control limits

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JC3254-17

Naphthalene RF = 2.312

[ ] = (334970)(4)/(411339)(2.312)

= 1.41 ppb OK

All criteria were met _X___
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

B. Percent Solids

List samples which have ≤ 50 % solids

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)